Directions: Please answer the following questions and make sure your answer are legible. If you don’t show work and/or I can’t follow it, I won’t give partial credit. You may not use a calculator (or any other technology) on this quiz. Good Luck.

1. (3 points) A 5 inch by 7 inch (rectangular) photo is sitting in a picture frame. The frame is 2 inches wide. What is the area of the frame?

\[
\text{Area Frame} = 11 \cdot 9 - 5 \cdot 7 = 99 - 35 = 64 \text{ in}^2
\]

2. (4 points) Find the quotient and remainder when \(2x^3 - 6x^2 + \frac{1}{2}x\) is divided by \(2x - 3\)

\[
\begin{align*}
\text{Quotient:} & \quad x^2 - \frac{2}{3}x - 3 \\
\text{Rem} & \quad -6
\end{align*}
\]

\[
\begin{array}{c}
2x^3 - 6x^2 + \frac{1}{2}x \\
\hline
2x - 3 \\
\frac{2x^3 - 6x^2 + \frac{1}{2}x}{2x - 3} = x^2 - \frac{3}{2}x - 3 - \frac{6}{2x - 3}
\end{array}
\]

3. (4 points) Factor the following polynomials completely

(a) \(125 - x^3 = (5 - x)(25 + 5x + x^2)\)
(b) \(x^4 - 6x^2 + 8 = (x^2 - 4)(x^2 - 2) = (x + 2)(x - 2)(x + \sqrt{2})(x - \sqrt{2})\)

4. (4 points) Perform the indicated operation and simplify the result, leave your answer in factored from.

\[
\frac{(x+4)(x-1)}{x^2-x-12} \div \frac{x^2-16}{x^2+3x} = \frac{(x+4)(x-1)(x^2+3x)}{(x^2-x-12)(x^2-16)} = \frac{(x+4)(x-1)(x)(x+3)}{(x-4)(x+3)(x+4)(x-4)}
\]

\[
= \frac{(x+4)(x-1)}{(x-4)(x-4)} \quad x \neq 4, -4, -3, 0
\]